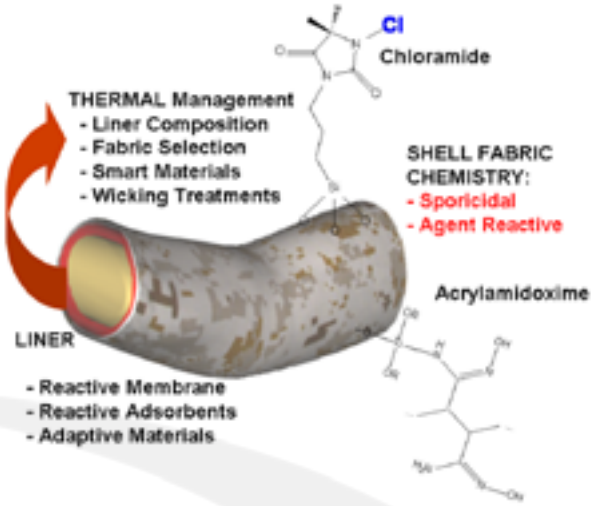
INTEGRATED PROTECTIVE FABRIC SYSTEMS | WarSTAR

OBJECTIVES:

To serve as a technology incubator to develop advanced methodologies to integrate protective fabric concepts into a novel CB protective fabric system that will be demonstrated in a separate demonstration project in FY10.

APPROACHES:

Develop an integrated protective fabric system incorporating novel technologies and materials through a rational build/test/design/optimize approach to provide both a) individual reactive/protective fabric components, and b) integrated protective layered systems. This project will use reactive chemicals attached to the fabrics for detoxification of chemical and biological contaminants, membranes to allow cooling through sweat evaporation along with chemical protection, new adsorbents to replace carbon in protective fabrics, and smart materials that sense and adapt fabric properties in the presence of an agent threat.



DESCRIPTION OF INTEGRATED PROTECTIVE FABRIC SYSTEM TECHNOLOGIES INTO CHEMICAL PROTECTIVE SUIT

POTENTIAL BENEFITS OF THIS TECHNOLOGY:

Increased aerosol protection, improved comfort and protection levels, and neutralization of CB agents. Reduced hazards from contaminated clothing.

TECHNICAL CHALLENGES:

- Compatibility of reactive materials when integrated?
- Durability and stability?
- Need new test methods for fate of agents.
- Will our modeling serve as a predictive tool for design?

CANDIDATE MATERIALS:

- Chloramide-treated fabrics for spore and agent protection.
- Oximes for agent protection on fabric surfaces.
- Poly(vinylamine) membranes for selective vapor permeation and agent destruction.
- Metal organic frameworks and new carbon fiber based textiles for lighter protective fabric systems.

NEW EXPERIMENTAL REACTIVE LINER MATERIAL WITH COVER FABRIC

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